

CLAIMS

1. A method of operating an information apparatus that is on a local area network for outputting an image of a digital document that can be accessed by the information apparatus, the digital document including at least part of a text or graphics information, said method comprising:

rasterizing the digital document on the information apparatus to generate image data,

creating an intermediate output data from the image data,

transmitting the intermediate output data to an output device that is on said local area network and includes an output engine that outputs images with a device-specific output size and resolution,

recovering the image data from the intermediate output data,

converting the image data to instructions compatible with the output engine, based at least in part on the device-specific output size and resolution of the output engine,

providing the instructions to the output engine, and

operating the output engine in response to said instructions and thereby outputting an image of the digital document.

2. A method according to claim 1, wherein the output engine is one of a marking engine, a display engine and a projection engine.

3. A method according to claim 1, wherein the intermediate output data includes a mixed raster content encoding.

4. A method according to claim 1, wherein the output device is printing device that includes a printer controller and an output controller, the method further comprising,

generating with the output controller a print data that is acceptable to the printer controller and including the recovered image data into the print data, and

passing the print data to the printer controller for converting the image data into instructions compatible with the output engine, based at least in part on the device-specific output size and resolution of the marking engine.

5. A method according to claim 4, in which the print data includes a page description language and the method comprises generating with the output controller a page description language

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(PDL) representation of the digital document to the printer controller and interpreting with the printer controller the PDL representation and converting the image data based at least in part on said device-specific output size and resolution.

6. A method according to claim 1, wherein the image included in the intermediate output data is encoded at least with predetermined standard output size and resolution and the rasterizing step includes calculating at least one scale factor relating to the output size and resolution of the digital document to said predetermined standard output size and resolution and employing said scale factor as a rasterization parameter in the rasterizing step.

7. A method according to claim 7, wherein the predetermined standard output size and resolution is included in the output device and the step of converting the image data to instructions compatible with the output engine further includes converting the image data from at least the standard output size and resolution to the output size and resolution of the output engine.

8. A method according to claim 1, wherein the step of creating the intermediate output data includes at least one of compression, encoding, encryption and color correction.

9. A method according to claim 1, wherein the step of creating the intermediate output data includes creating an intermediate output data that includes at least one of an image, instructions, and a color profile.

10. A method according to claim 1, wherein the step of recovering the raster image data from the intermediate output data includes at least one of decoding, decryption, and decompression.

11. A method according to claim 1, wherein the step of converting the image data to instructions includes at least one of color space conversion, scaling, interpolation, color matching and halftoning.

12. A method according to claim 1, including obtaining a rasterization vector to the information apparatus and using said rasterization vector in the rasterizing step.

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13. A method according to claim 12, wherein the rasterization vector has at least one component related to the output device and includes one or more of an output size, resolution, color space, and bit depth.

14. A method according to claim 12, wherein at least one component of the rasterization vector is based on a predetermined standard value or default.

15. A method according to claim 12, wherein the rasterization vector is obtained from the output device.

16. A method according to claim 1, wherein the method includes selecting an output device description from a plurality of output device descriptions presented to a user of the information apparatus.

17. A method according to claim 12, comprising inputting user preferences as components of a rasterization vector and using said rasterization vector in the rasterizing step.

18. A method of outputting an image of a digital document that can be accessed by an information apparatus to an output system, the output system including information related to predetermined standard rasterization parameter values that include one or more of bit depth, color space, output size, and resolution, said method comprising:

generating image data by rasterizing the digital document on the information apparatus in accordance at least in part with at least one predetermined standard rasterization parameter value,

creating on the information apparatus an intermediate output data that includes the image data,

transmitting the intermediate output data from the information apparatus to an output system that includes an output engine that outputs an image with at least one device specific value that includes bit depth, color space, output size, or resolution,

recovering the image data from the intermediate output data, converting the image data with the at least one predetermined standard rasterization parameter value to instructions compatible with the output engine that include the at least one device specific value,

providing the instructions to the output engine, and
operating the output engine in response to said instructions
and thereby outputting an image of the digital document.

19. A method according to claim 18, wherein the output device is a printing device and the output engine is a marking engine.

20. A method according to claim 18, comprising selecting said output system from among a plurality of available output systems and uploading at least one value specifying said predetermined rasterization parameters to the information apparatus,

21. A method of outputting an image of a digital document that can be accessed by an information apparatus, the digital document including at least part of a text or graphics information, said method comprising:

selecting an output device model from a menu of models presented by the information apparatus, each model of output device including an output engine, and each output engine being characterized by a value of a rasterization vector,

accessing a value of the rasterization vector related to the output engine of the selected model,

rasterizing the digital document on the information apparatus in accordance with said rasterization vector to generate image data,

creating an intermediate output data on the information apparatus that includes the image data,

transmitting the intermediate output data from the information apparatus to an output device of said selected model,

recovering the image data from the intermediate output data,

converting the image data to instructions compatible with the output engine of the output device,

providing the instructions to the output engine of the output device, and

operating the operating engine in response to said instructions and thereby outputting an image of the digital document.

22. A method according to claim 21, wherein the rasterization vector is obtained from the output device.

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23. A method according to claim 21, wherein the output device is a printing device and the output engine is a marking engine.

24. A method of outputting an image of a digital document that can be accessed by an information apparatus, said method comprising:

 rasterizing the digital document on the information apparatus to generate image data,

 creating an intermediate output data on the information apparatus, the intermediate output data including the image data, the image data being composed of a background layer and at least one foreground layer,

 transmitting the intermediate output data to an output device that includes an output engine,

 recovering the image data from the intermediate output data, converting the image data into instructions compatible with the output engine,

 providing the instructions to the output engine, and

 operating the output engine in response to said instructions and thereby outputting an image of the digital document.

25. A method according to claim 24, wherein the image data comprises a background layer and at least one pair of layers composed of a foreground layer and a mask layer.

26. An imaging system comprising:

 a local area network having a propagation medium and at least first and second nodes, said first node including an information apparatus and said second node including an output device, said output device including an output engine for outputting images,

 a first means on the information apparatus for rasterizing a digital document to generate image data,

 a second means on the information apparatus for creating an intermediate output data that includes the image data,

 a third means on the information apparatus for impressing the intermediate output data on the propagation medium, and

 an output controller at the second node for retrieving the image data from the intermediate output data and converting the image data into instructions compatible with the output engine.

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27. An imaging system according to claim 26, wherein the information apparatus includes a means for storing values for the predetermined standard size and resolution and the first means is adapted to rasterize the digital document to said predetermined standard output size and resolution.

28. An imaging system according to claim 26, wherein the output device includes a means for uploading to the information apparatus an output device profile that specifies device specific rasterization parameter values that include one or more of bit depth, output size and resolution to the information apparatus.

29. A method of outputting an image of a digital document that can be accessed by an information apparatus, said method including:

- (a) establishing bidirectional communication between the information apparatus and at least two output devices,
- (b) receiving a message from a first available output device specifying a feature of the first available output device,
- (c) determining from the message from the available output device whether the feature of the available output device matches a requirement for outputting the digital document,
- (d) if so, selecting said available output device and transmitting image data to the selected output device, and otherwise receiving a message from another available output device specifying a feature of the other available output device, and
- (e) repeating steps (c) and (d).

30. A method according to claim 29, comprising, prior to step (b), transmitting from the information apparatus a message that calls for a receiving output device to transmit a message that specifies a feature of the respective output device.

31. A method according to claim 29 in which the feature includes one or more of a quality of service, a price indicator, a status indicator, an availability indicator, and an output data format indicator.